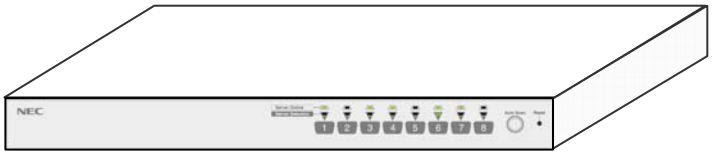

N8191-10F
Server Switch Unit (8Server/USB) User's Guide

July 2007

FCC STATEMENT

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

MOMENTARY VOLTAGE DROP PREVENTION

This product may be affected by a momentary voltage drop caused by lightning. To prevent a momentary voltage drop, an AC uninterruptible power supply (UPS) unit should be used.

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Read this "Safety Precautions" and separately provided user's guide thoroughly before getting started to use this device safely. After you have read this brochure, store it in the place that is easy to access.

⚠ SAFETY PRECAUTIONS

This section describes the information necessary to use the server switch unit safely.

SAFETY INDICATIONS

Follow the instructions described in this User's Guide for your safety to use the server switch unit.

The server switch unit contains components with possible danger, hazards that may cause by ignoring warnings, and preventive actions against such hazards. The server switch unit components with possible danger are indicated with a warning label placed on or around them as well as described in this User's Guide.

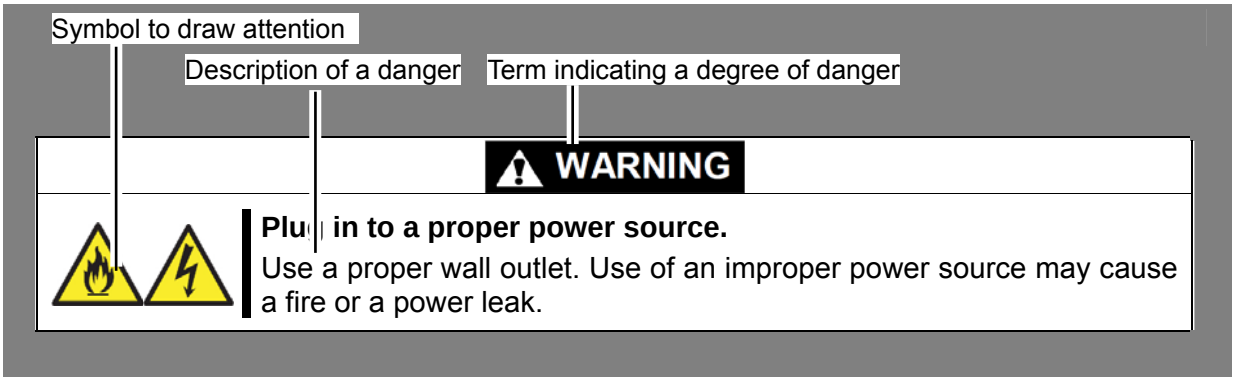
In the User's Guide or warning labels, "WARNING" or "CAUTION" is used to indicate a degree of danger. These terms are defined as follows:

⚠ WARNING	This symbol indicates that using the product improperly in defiance of this symbol is likely to result in death, serious injury, fire, or damage to the device and peripherals.
⚠ CAUTION	This symbol indicates that using the product improperly in defiance of this symbol may result in injury or only damage to property.

Precautions against hazards are presented with the following symbols. The individual symbols are defined as follows:

	Attention	This symbol indicates the presence of a hazard. An image in the symbol illustrates the hazard type.	(Example) Precaution against electric shock
	Prohibited Action	This symbol indicates prohibited actions. An image in the symbol illustrates a particular prohibited action.	(Example) Prohibition of disassembly
	Mandatory Action	This symbol indicates mandatory actions. An image in the symbol illustrates a mandatory action to avoid a particular hazard.	(Example) Unplug the power cord!

(Example)


Symbol to draw attention
Description of a danger
Term indicating a degree of danger
WARNING
Plu in to a proper power source.
Use a proper wall outlet. Use of an improper power source may cause a fire or a power leak.

SYMBOLS USED IN THIS USER'S GUIDE AND WARNING LABELS

ATTENTIONS

	Indicates that improper use may cause an electric shock.		Indicates that improper use may cause fumes or fire.
	Indicates that improper use may cause fingers to be caught.		Indicates a general notice or warning that cannot be specifically identified.
	Indicates that improper use may cause a personal injury.		Indicates that improper use may cause personal injury due to explosion or bursting.

PROHIBITED ACTIONS

	Do not disassemble, repair, or modify the server switch unit. Otherwise, an electric shock or fire may be caused.		Keep water or liquid away from the server switch unit. Otherwise, an electric shock or a fire may be caused.
	Do not touch the server switch unit components with wet hand. Otherwise, an electric shock may be caused.		Indicates a general prohibited action that cannot be specifically identified.

MANDATORY ACTIONS

	Unplug the power cord of the server switch unit. Otherwise, an electric shock or fire may be caused.		Be sure to provide earthing. Otherwise, an electric shock or fire may be caused.
	Indicates a mandatory action that cannot be specifically identified. Make sure to follow the instruction.		

SAFETY NOTES

This section provides notes on using your server switch unit safely. Read this section carefully to ensure proper and safe use of the server switch unit. For symbols, see "SAFETY INDICATIONS" provided earlier.

GENERAL

⚠ WARNING

Do not use the server switch unit for services where critical high availability may directly affect human lives.

Your server switch unit is not intended to be used with or control facilities or devices concerning human lives, including medical devices, nuclear facilities and devices, aeronautics and space devices, transportation facilities and devices; and facilities and devices requiring high reliability. NEC assumes no liability for any accident resulting in personal injury, death, or property damage if the server switch unit has been used in the above conditions.

Do not use the server switch unit if any smoke, odor, or noise is present.

If smoke, odor, or noise is present, immediately turn off the server switch unit and disconnect the power plug from the outlet, then contact your service representative. Using the server switch unit in such conditions may cause a fire.

Keep needles or metal objects away from the server switch unit.

Do not insert needles or metal objects into the server switch unit. Doing so may cause an electric shock.

⚠ CAUTION

Keep water or foreign matter away from the server switch unit.

Do not let any form of liquid (water etc.) or foreign matter (e.g., pins or paperclips) enter the server switch unit. Failure to follow this warning may cause an electric shock, a fire, or a failure of the unit. When such things accidentally enter the server switch unit, immediately turn off the power and disconnect the AC cord from the outlet. Do not disassemble the server switch unit. Contact your service representative.

POWER SUPPLY AND POWER CORD USE

⚠ WARNING

Do not hold the power plug with a wet hand.

Do not disconnect/connect the plug while your hands are wet. Failure to follow this warning may cause an electric shock.

Do not connect the ground wire to a gas pipe.

Never connect the ground wire to a gas pipe. Failure to follow this warning may cause a gas explosion.

⚠ CAUTION

Plug in to a proper power source.

Use a proper wall outlet. Use of an improper power source may cause a fire or a power leak.
Do not install the server switch unit where you need an extension cord. Use of a cord that does not meet the power specifications of your server switch unit may heat up the cord and cause a fire.

Do not connect the power cord to an outlet that has an illegal number of connections.

The electric current exceeding the rated flow overheats the outlet, which may cause a fire.

Do not pull the cord harness to disconnect the power cord.

Hold the connector of the power cord and pull it straight. Pulling the cord harness or applying excess force to the connector may cause a damage to the cable, resulting in a fire or an electric shock.

Insert the power plug into the outlet as far as it goes.

Heat generation resulting from a halfway inserted power plug (imperfect contact) may cause a fire. Heat will also be generated if condensation is formed on dusty blades of the halfway inserted plug, increasing the possibility of fire.

⚠ CAUTION

Use the authorized power cord only.

Use only the power cord that comes with your server switch unit. Use of an unauthorized power cord may cause a fire when the electric current exceeds the rated flow.
Also, observe the following to prevent an electric shock or fire caused by a damaged cord.

- Do not stretch the cord harness.
- Do not pinch the power cord.
- Do not bend the power cord.
- Keep chemicals away from the power cord.
- Do not twist the power cord.
- Do not place any object on the power cord.
- Do not step on the power cord.
- Do not alter, modify, or repair the power cord.
- Do not bundle power cords.
- Do not secure the power cord with staples or equivalents.
- Do not use any damaged power cord. (Replace a damaged power cord with a new one of the same specifications. Ask your service representative for replacement.)

Do not use the attached power cord for any other devices or usage.

The power cord that comes with your server switch unit is designed aiming to connect with this server switch unit, and its safety has been tested. Do not use the attached power cord for any other purpose. Doing so may cause a fire or an electric shock.

RACK

The server switch unit can be installed in standard EIA 19-inch rack assembly.

⚠ CAUTION

Do not carry or install the rack only by a single person.

At least two persons are required to carry or install the rack. Failure to follow this instruction may cause the rack to fall to result in personal injury and/or breakages of surrounding devices. In particular, a high rack (such as 44U rack) is unstable if it is not fixed by stabilizers. More than one person must always carry or install the rack while they support it.

Do not install the devices so that the load may be concentrated on a specific point.

Install stabilizers on the rack so that the total load of the rack and devices mounted on the rack is not concentrated on a singe point or join more than one rack with each other to distribute the load. Failure to follow this instruction may cause the rack to fall to result in personal injury.

Do not install components on the rack only by a single person.

At least two persons are required to install parts including the doors and trays for the rack. Failure to follow this instruction may cause some parts to fall to be broken and/or to result in personal injury.

Insert hinges completely.

When installing the rack door, make sure that hinge pins at top and bottom of the door are completely inserted into the rack. Failure to follow this instruction may cause the door to fall to be broken and/or to result in personal injury.

Do not pull out a device from the rack if the rack is unstable.

Always pull out a device from the rack in the state that the rack is made stable (by the installation of stabilizers or earthquake-resistant construction).

Do not leave more than one device being pulled out from the rack.

Pulling out more than one device from the rack may cause the rack to be fallen. Only pull out a single device from the rack at a time.

Do not provide the wiring for the rack to exceed the rating of the power supply.

To prevent burns, fires, and device damages, the power supplied to the power supply in the rack shall not exceed the rating load of the power branch circuit. Contact your electric constructor or the local power company for the requirements on the wiring and installation of electric facilities.

INSTALLING IN RACK

Your server switch unit can be installed in the rack by using the provided rails.

⚠ WARNING

Do not use the server switch unit in any unapproved place.

Install the server switch unit on a standard EIA 19-inch rack assembly. Do not install the rack containing the server switch unit in a place inappropriate to the rack installation environment.
Failure to follow these instructions may cause some bad influences to be imposed on the server switch unit and other systems installed on the rack and also a fire or personal injury due to falling of the rack may occur. For the detailed explanation on the place where the server switch unit should be installed and the earthquake-resistant construction for the rack, refer to the manual attached to the rack or contact you service representative.

Always install the server switch unit on a rack conforming to the relevant standard.

Install the server switch unit on a rack confirming to the EIA standard for the NEC Express server to be used. Do not use the server switch unit with installed on any other rack than standard EIA 19-inch rack or without the installation on a proper rack. Failure to follow these instructions may cause the server switch unit to operate incorrectly and/or personal injury or damages of surrounding devices to occur. Contact your service representative for the racks available for the server.

⚠ CAUTION

Do not pinch your finger with rails or other components.

Note sufficiently that your fingers may not be caught between a rail and another mechanical part or cut by a rail at installation or removal of the server switch unit from the rack.

Do not press the release lever with your finger.

When installing/removing the NEC Express server in/from the rack, the sliding rails attached to the server may be locked on its way. If the sliding rail has release levers on its left and right sides, use the screwdriver or equivalent tool to press the release lever. Pressing the lever with your finger may cause personal injury.

INSTALLATION, RELOCATION, STORAGE, AND CONNECTION

CAUTION

Do not install the server switch unit in any place other than specified.

Do not install the server switch unit in the following places or any place other than specified in this user's guide. Failure to follow this instruction may cause a fire.

- a dusty place
- a humid place such as near a boiler
- a place exposed to direct sunlight
- an unstable place

Do not use the server switch unit in the place where corrosive gases exist.

Make sure not to locate or use the server switch unit in the place where corrosive gases (sulfur dioxide, hydrogen sulfide, nitrogen dioxide, chlorine, ammonia, ozone, etc.) exist. Also, do not set it in the environment where the air (or dust) includes components accelerating corrosion (ex. sulfur, sodium chloride) or conductive metals. There is a risk of a fire due to corrosion and shorts of an internal printed board.

Do not connect any interface cable with the power cord of the server switch unit plugged into a power source.

Make sure to power off the server switch unit and unplug the power cord from a power outlet before connecting/disconnecting any interface cable to/from the server switch unit. If the server switch unit is off-powered but its power cord is plugged to a power source, touching an internal device, cable, or connector may cause an electric shock or a fire resulted from a short circuit.

Do not use any unauthorized interface cable.

Use only interface cables provided by NEC and locate a proper device and connector before connecting a cable. Using an authorized cable or connecting a cable to an improper destination may cause a short circuit, resulting in a fire. Also, observe the following notes on using and connecting an interface cable.

- Do not use any damaged cable connector.
- Do not step on the cable.
- Do not place any object on the cable.
- Do not use the server switch unit with loose cable connections.
- Do not use the server switch unit if it is not locked with screws.
- Do not use any damaged cable.

CLEANING AND WORKING WITH SERVER SWITCH UNIT

⚠ WARNING

Do not disassemble, repair, or alter the server switch unit.

Never attempt to disassemble, repair, or alter the server switch unit on any occasion other than described in this manual. Failure to follow this instruction may cause an electric shock or fire as well as malfunctions of the server switch unit.

Disconnect the power plug before accessing inside the server switch unit.

Make sure to power off the server switch unit and disconnect the power plug from a power outlet before cleaning. Touching the inside of server switch unit with its power cord connected to a power source may cause an electric shock even of the server switch unit is off-powered.
Disconnect the power plug from the outlet occasionally and clean the plug with a dry cloth. Heat will be generated if condensation is formed on a dusty plug, which may cause a fire

⚠ CAUTION

Make sure to complete installations.

Always install a power cable, interface cable, and/or board firmly. An incompletely installed component may cause a contact failure, resulting in smoking or fire.

DURING OPERATION

⚠ WARNING

Avoid contact with the server switch unit during thunderstorms.

Disconnect the power plug from the outlet when a thunderstorm is approaching. If it starts thundering before you disconnect the power plug, do not touch any part of the server switch unit including the cables. Failure to follow this warning may cause a fire or an electric shock.

Keep animals away from the server switch unit.

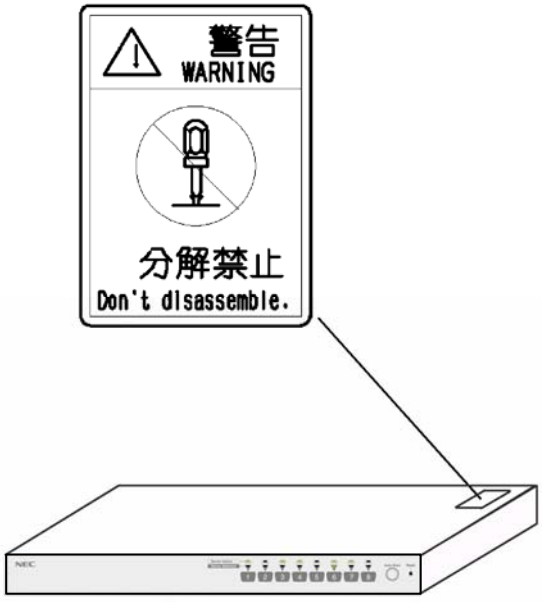
Failure to follow this warning may cause a fire or an electric shock.

Do not place any unnecessary object on top of the server switch unit.

Keep unnecessary object (e.g., cup or glass of drink) away from the server switch unit. Doing so may cause an electric shock or a fire if such a liquid enters the server switch unit.

WARNING LABELS

The warning label is attached to components with possible danger or their vicinity in the server switch unit to inform the user that a hazardous situation may arise when operating the unit (Do not intentionally remove or damage any of the labels.). If you find any labels totally/partially removed or illegible due to damage, contact your service representative.



ADVICE FOR HEALTH

The longer you keep using the computer equipment, the more you become tired, which may cause disorders of your body. When you use a computer, observe the following to keep yourself from getting tired:

Good Working Posture

You have good posture if the following are satisfied when you use a computer:

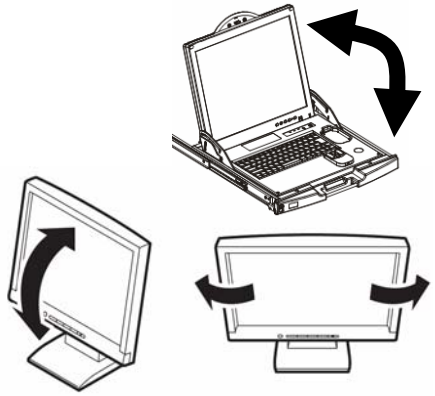
- You sit on a chair with your back straight.
- Your hands are parallel with the floor when you put them on the keyboard.
- You look at the screen slightly lower than your eye height.

You have "good working posture" as described in the above when no part of your body is under excess strain, in other words when your muscles are most relaxed.

You have "bad posture" when you sit with your back hunched up or you operate a display unit with your face close to the screen. Bad working posture may cause eye strain or poor eyesight.

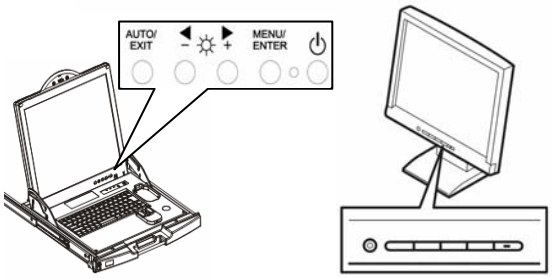
Adjustment of Display Unit Angles

Most display units are designed for adjustment of the horizontal and vertical angles. This adjustment is important to prevent the screen from reflecting bright lights and to make the display contents easy to see. You will not be able to keep "good working posture" and you will feel more tired than you should if you operate a display unit without adjusting horizontal and vertical angles.



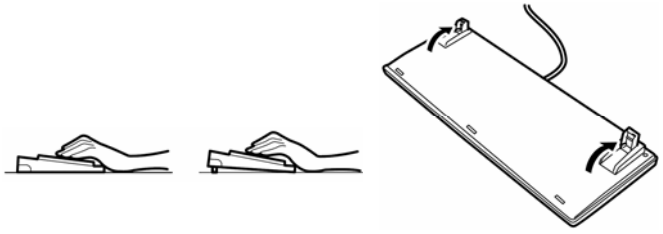
Adjustment of Screen Brightness and Contrast

The display unit has brightness and contrast adjustment functions. The most suitable brightness and contrast depend on the individual and the working environment (well-lighted room or insufficient light). Adjust brightness and contrast so that the screen will be easy to see. An extremely bright or dark screen will give a bad effect to your eyes.



Adjustment of Keyboard Angle

The keyboard provided with the server is designed for adjustment of an angle. Adjust the keyboard angle at which the keyboard is easy to operate. The adjustment assists in reducing strain on your shoulders, arms, and fingers.



Cleaning of Equipment

Clean equipment regularly. It is difficult to see the display contents on a dusty screen. Keeping equipment clean is also important for your sight.

Fatigue and Rest

If you feel tired, you should stop working and do light exercises.

TEXT CONVENTIONS

The following conventions are used throughout this manual. For safety symbols, see "SAFETY INDICATIONS" described earlier.

IMPORTANT：	Items that are mandatory or require attention when using the server switch unit.
NOTE：	Helpful and convenient piece of information.

PREFACE

Welcome to our N8191-10F server switch unit.

The server switch unit N8191-10F is a switching device developed for the NEC Express5800 server. With this unit, up to eight servers can be operated with one each of display unit, keyboard, and mouse (in the cascade connection with N8191-10F or N8143-69F, up to 64 servers can be operated). You can easily select the desired server using the server selection switch or the keyboard.

This manual is a guidance to use the unit properly. Read well the manual to operate the unit properly and surely.

FOR PROPER OPERATION

Observe the following notes for successful operation of the server switch unit. Use of the server switch unit ignoring the notes will cause malfunctions or failures of the unit.

- Make sure to power off the server switch unit and disconnect the AC cord from the power outlet before connecting or disconnecting cables.
- Check to see that the server online lamp goes off and unplug the power cord from the outlet before relocating the server switch unit.
- Clean the server switch unit on a regular basis (see Chapter 3). Regular cleaning proactively prevents various failures of the unit.
- Lightning may cause a momentary voltage drop. To prevent this problem, it is recommended to use an uninterruptible power supply.
- Use the keyboard and mouse which you purchased as components in the NEC Express5800 server system to connect them with the server switch unit. Using any other unauthorized keyboard and mouse cause failures of the unit as well as a malfunction of the unit.
- Do not press two or more switches simultaneously. Doing so may cause a malfunction of the unit.
- Use only the AC cord that comes with the server switch unit. Use of an unauthorized AC cord may cause a failure of the unit or a fire when the voltage exceeding the rated one is applied to the unit.
- Use NEC's genuine interface cables for options. Repair of the unit due to a failure or damage resulted from use of a third-party product will be charged even in the warranty period.

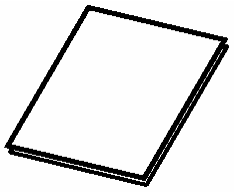
CHECK OF ACCESSORIES

The carton of the server switch unit contains several accessories as well as the unit. Make sure that all items listed below are provided and then inspect them. If one or more items are missing or defective, contact your service representative.

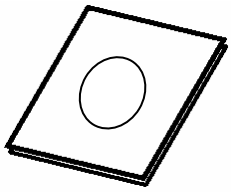
IMPORTANT: Store the provided accessories in a designated place for your convenience. You will need them to setup the server switch unit.

Server switch unit (N8191-10F)

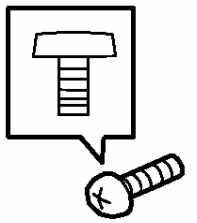
Startup Guide



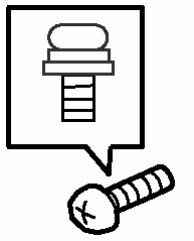
User's Guide CD-ROM



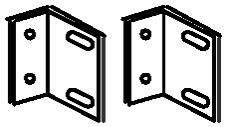
Screw A (M5) × 8



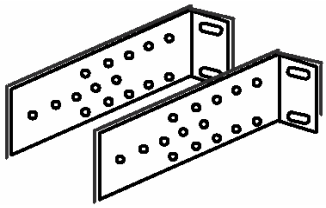
Screw B (M3) × 10



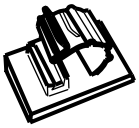
Rack mount brackets (small) × 2



Rack mount brackets (large) × 2



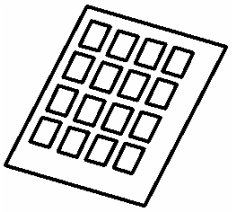
Cable clamp



Shock absorbers × 4

Tie wrap × 10

Device ID label
(36 pcs. per sheet)



TRANSFER TO THIRD PARTY

To transfer or sell the server switch unit to a third party, make sure to provide the User's Guide CD-ROM and all the accessories along with the product.

DISPOSAL AND CONSUMABLES

The server switch unit contains metallic and plastic components and liquid crystal fluorescent tube containing mercury.
Dispose of the server switch unit according to all national laws and regulations. Also dispose of the power cord provided with the server switch unit to avoid diversion to some other devices.

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CHAPTER 1

SETUP

This section describes the features and part names of the server switch unit. Also describes the installation and handling of the server switch unit.

FEATURES

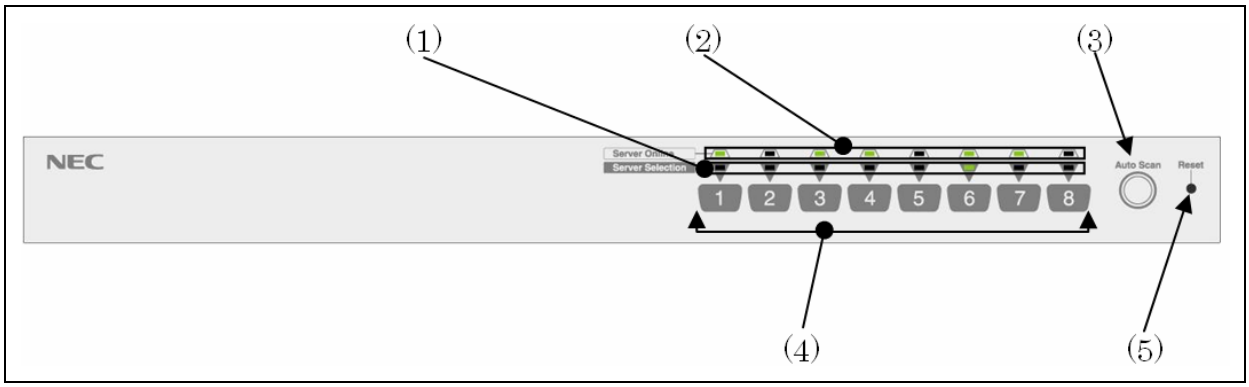
- This server switch unit allows the connection of multiple servers to a single console (monitor, keyboard and mouse). This greatly saves installation space by reducing the number of dedicated consoles required for each server.
- A single server switch unit enables the user to select a specific server from up to eight servers.
- To connect the N8191-10F server switch unit with eight N8191-10F server switch unit in cascade connection enables a server to be selected from up to 64 servers.
- To connect the N8143-69F console unit with eight N8191-10F server switch unit in cascade connection enables a server to be selected from up to 64 servers.
- The server switch unit can be mounted on a standard 19-inch rack using the space of 1U in height.
- Due to the separation of the console panel from the rear panel (main unit), servers can be easily connected to the server switch unit when mounted in a rack.
- The server switch unit is equipped with a dedicated control microprocessor (MPU) for each of the ports (including keyboard, mouse and each server ports). Accordingly, the keyboard and mouse states for each server (including key code mode, Num, Caps, and Scroll locks , and mouse output mode) are monitored by the MPU for each port, respectively. This allows for the stable switching of one server to another.
- The server switch unit is equipped with power voltage monitoring circuits; any failure in the power supply (e.g., disconnection of the AC cord or damage of the internal power fuse) can be detected. (Signified with a flashing server online lamp)
- The PS/2 keyboard English or Japanese (101 to 109 keys) and mouse which is included 21with the NEC Express5800 server may be connected to with the server switch unit.
- The server switch unit may be connected with English or Japanese keyboard (101 to 109) that came with the NEC Express5800 server.
- The server switch unit can support monitors with a refresh rate of up to 75 MHz in the VGA, SVGA, or multi-sync mode and a resolution of up to 1600×1200 pixels.
- The servers can be easily selected by using the server selection switch or the keyboard (in the hot key mode).
- In hot key mode, the OSD (On Screen Display) allows you to switch from one server to another while viewing the screen.
- Auto scan can be performed by using the switches or hot keys.
- In auto scan mode, active servers are automatically switched from one to another. This enables the status of each server to be monitored in one specified cycle. The monitoring cycle can be configured in six different time period levels (intervals) by using the keyboard.

- Hot keys can be set by selecting one of three key entries; depression of **Ctrl** + **Alt** + **Shift** keys or two successive depressions of **Ctrl** key or **Scroll Lock** keys.
  This allows the user to avoid using a specific key sequence used in another application as the hot key. Thus, the hot key can be utilized more effectively.

NAMES AND FUNCTIONS OF COMPONENTS

The names of the components of the server switch unit are shown below. Check the name and position of each component.

FRONT VIEW (CONSOLE PANEL SIDE)



(1) Server selection lamp (green)

When a server is selected, the respective lamp will be lit. In hot key mode, the lamp will blink.

(2) Server online lamp (green)

The server online lamps will be lit when the power of the servers are ON.

The server online lamp will blink when an abnormal internal voltage is detected. If this occurs, Check to see if the AC cord is connected properly. If the lamp still blinks, a failure in the server switch unit may have occurred. Contact your sales agent or service representative.

(3) Auto scan switch

Press this switch to sequentially scan the server screens.

Press this switch again to halt the auto scan.

During the auto scan, the server selection lamps will blink slowly in sequential order; no server operations can be performed at this time.

(4) Server selection switch

Press one of the server selection switches to select the respective server.

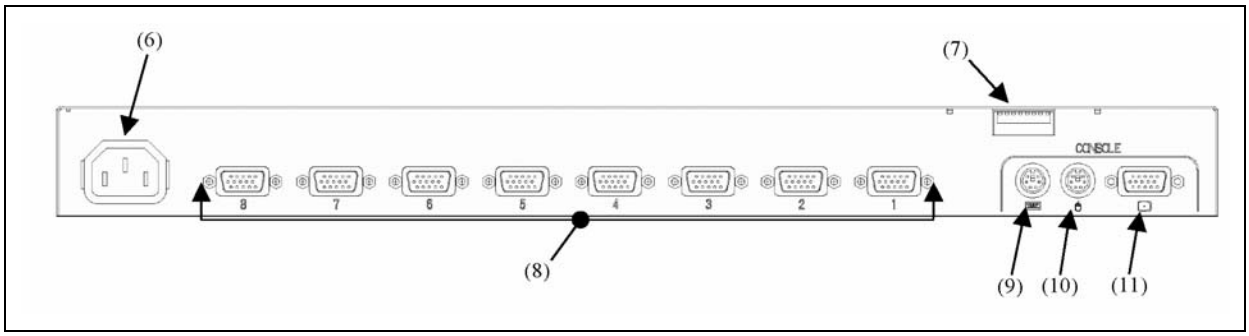
A server with an unlit server online lamp may be selected.

(5) Reset switch

The reset switch is not used under normal operations. This switch is used if none of the servers can be selected or the keyboard and/or mouse does not function. Press the reset switch with a metallic pin.

Pressing the switch will reset the server switch unit to its initial state. The server switch unit can be reset to its original state without restarting the servers.

REAR VIEW (REAR PANEL SIDE)



(6) Power connector

Used to connect the provided power cord.

(7) DIP switch

Used to set key assignment calling OSD functions, Always ON Mode, and keyboard type (valid only for USB connection). Switch functions are assigned as follows:

SW No.	Function	Default setting
SW1	Enable/disable the hot key [**Ctrl** + **Alt** + **Shift**]	ON [Enabled]
SW2	Enable/disable the hot key [**Ctrl** × 2]	ON [Enabled]
SW3	Enable/disable the hot key [**Scroll Lock** × 2]	ON [Enabled]
SW4	Selection of keyboard connected 1	See Language Table below.
SW5	Selection of keyboard connected 2	
SW6	Selection of keyboard connected 3	
SW7	Selection of keyboard connected 4	
SW8	Normally power-on state	OFF (linkage with power-on of the server)

Language Table

Country	SW4	SW5	SW6	SW7
JIS	**[ON]**	**[ON]**	**[ON]**	**[ON]**
US	ON	ON	ON	OFF
UK	ON	ON	OFF	ON
Germany	ON	ON	OFF	OFF
France	ON	OFF	ON	OFF
Spain	ON	OFF	ON	OFF
Sweden	ON	OFF	OFF	ON

(8) Server port connector(1 to 8)

・K410-118 cable（for USB connection）

Connect with the server through USB or VGA interface.

・K410-119 cable（for PS/2 connection）

Connect with the server through PS/2 keyboard and mouse or VGA interface.

Connect one end of the K410-119(1A) cable to each port of the server switch unit, and connect the other end of K410-119(1A) cable to the another server switch unit's console connectors (KB, mouse, and VGA). This allows up to 64 servers to be connected.

(9) KB connector

Used to connect the server switch unit to the console PS/2 keyboard.

(10) Mouse connector

Used to connect the server switch unit to the console PS/2 mouse.

(11) Console connector

Used to connect the server switch unit to the console monitor.

INSTALLATION

The server switch unit can be placed on a desktop, or installed in a standard EIA 19-inch rack assembly.

INSTALLATION OF RACK

Refer to the documentation attached to the server rack or contact your service representative for the rack installation of the server switch unit.

Follow the instructions below to install the rack assembly.

⚠ WARNING

Observe the following instructions to use the server and peripheral devices safely. Failure to follow these instructions may result in death or serious personal injury. See pages iii to xvi for details.

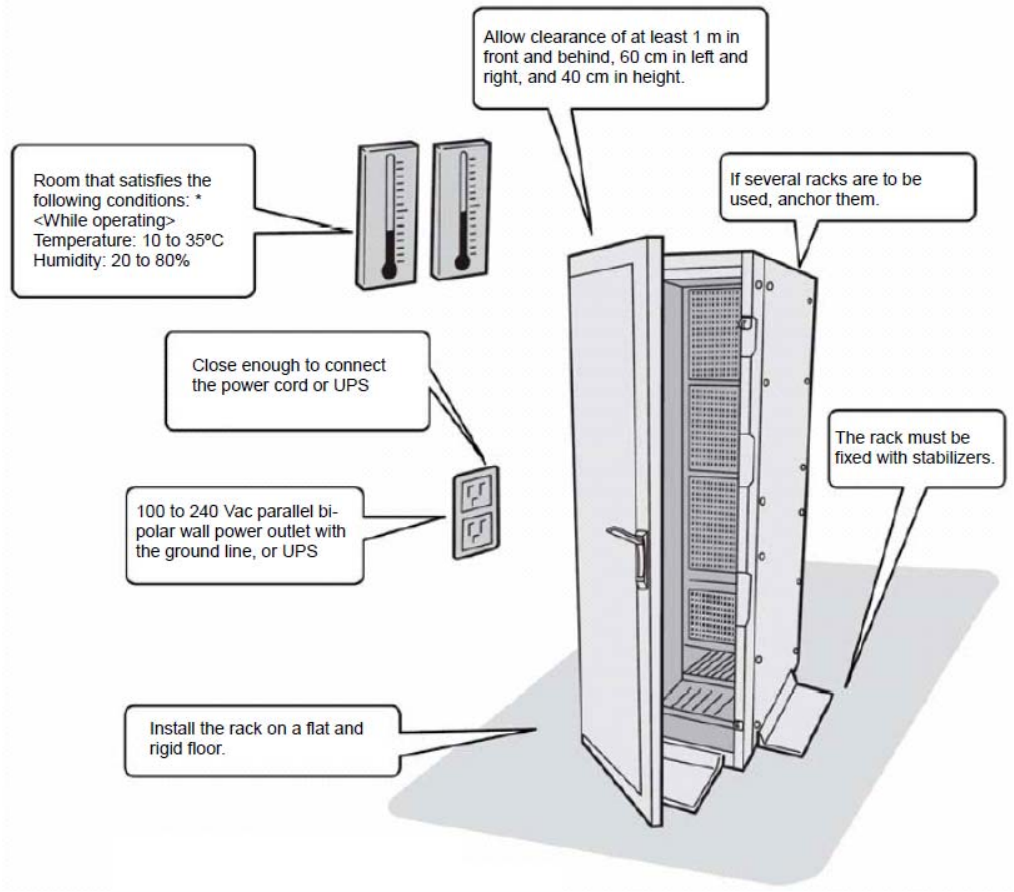
- Do not use the server switch unit in any unapproved environments.

⚠ CAUTION

Observe the following instructions to use the server and peripheral devices safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages iii to xvi for details.

- Do not carry or install the rack assembly only by a single person.
- Do not install the devices where the load may be concentrated on a specific point.
- Do not install any server on the rack only by a single person.
- Do not pull out a device from the rack if the rack is unstable.
- Do not leave more than one device being pulled out from the rack.
- Do not provide the wiring exceeding the rating power.

The following figure illustrates a site suitable for installing the server switch unit.


Allow clearance of at least 1 m in front and behind, 60 cm in left and right, and 40 cm in height.
Room that satisfies the following conditions: * <While operating> Temperature: 10 to 35ºC Humidity: 20 to 80%
If several racks are to be used, anchor them.
Close enough to connect the power cord or UPS
The rack must be fixed with stabilizers.
100 to 240 Vac parallel bi-polar wall power outlet with the ground line, or UPS
Install the rack on a flat and rigid floor.

* It is recommended that the server switch unit should be used in a room where temperature is in the range between 15 to 25ºC.

IMPORTANT：If more than one devices are installed on the rack or the ventilation within the rack is not enough, the temperature in the rack may be raised by the heat generated from the units to be higher than the operation temperature of the server (10 to 35°C).
It causes the server products to operate improperly. Review the air flow within the rack or in the room and take sufficient measures so that the temperature within the rack does not exceed the warranted temperature range during the system operation.

The server rack should not be installed in places such as listed below. Installing the rack or mounting the server switch unit in a rack in such a place may result in an occurrence of a malfunction.

- Narrow space from which the server and/or peripheral devices cannot be pulled out from the rack completely.
- Place that cannot bear the total weights of the rack and devices mounted on the rack.
- Place where stabilizers cannot be installed or where the proper earthquake-resistant construction can not be practiced.
- Place of uneven or slanting floor.
- Place of drastic temperature change (near a heater, air conditioner, or refrigerator).
- Place which much dust.
- Place where intense vibration may be generated.
- Place where corrosive gases (sulfur dioxide, hydrogen sulfide, nitrogen dioxide, chlorine, ammonia, ozone, etc.) exist.
  Place where the air (or dust) includes components accelerating corrosion (ex. sulfur, sodium chloride) or conductive metals.
  Place where chemicals are nearby, or chemicals may be sprayed accidentally.
- Place where a carpet not subject to anti-static process is laid.
- Place where some objects may be fallen on the rack.
- Place near a device generating intense magnetic field (such as a TV, radio, broadcast/communication antenna, power transmission wire, and electromagnetic crane) is placed (If unavoidable, contact your service representative to request proper shield construction.)
- Place where the power cord of the server switch unit must be connected to an AC outlet that shares the outlet of another device with large power consumption.
- Place near equipment that generates power noise (e.g., contact spark at power-on/power-off of commercial power supply through a relay). If you must install the server switch unit close to such equipment, request your service representative for separate power cabling or noise filter installation.

INSTALLING SERVER SWITCH UNIT ON RACK

Follow the server switch unit on a proper rack in the following procedure:

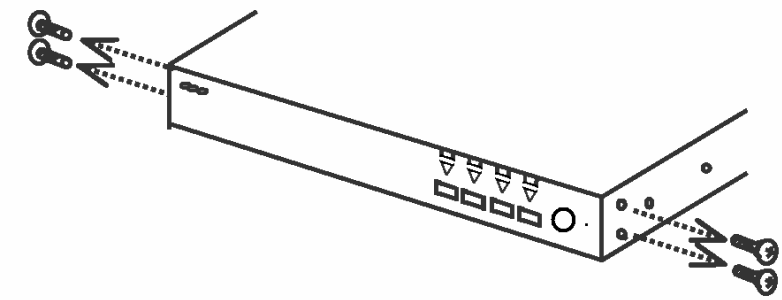
⚠ CAUTION

Observe the following instructions to use the server and peripheral devices safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages iii to xvi for details.

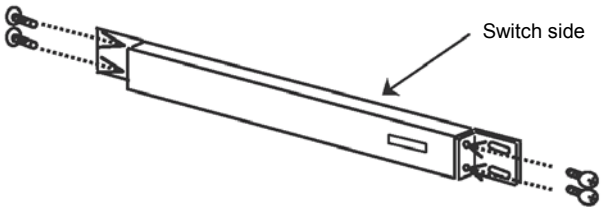
- Do not use the server switch unit in any unapproved place.
- Avoid contact with the server switch unit including cables during thunderstorms. Doing so may cause an electric shock.

The server switch unit should be mounted on a rack following the proper procedures listed below;

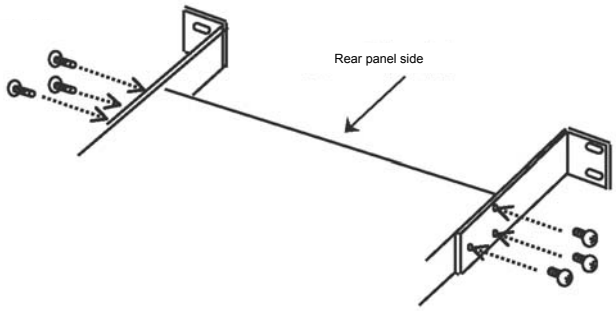
1. Remove the console connection cable from the rear of the unit.
   Remove the four shock absorbers located at the bottom of the unit (if installed).
2. Remove the four flat head screws from the left and/or right ends of the console panel.
   (Keep these screws for future use.)



3. Remove the console panel from the unit and install the smaller rack mount bracket onto both sides of the panel by using screw B (two screws each).



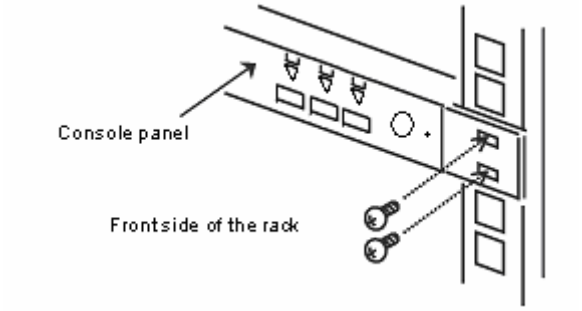
4. Install the larger rack mount bracket on the rear panel screw B (three screws each).



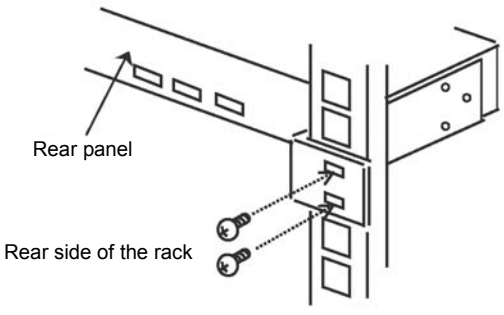
NOTE：The larger rack mount brackets have five screw holes to fit the depth of the rack. Install the larger rack mount bracket according to its depth.

5. Install the four core nuts (coming with the rack) in the positions where the console panel and rear panel will be mounted. See the rack operation manual for core nuts installation procedures.

6. Fix the front side console panel onto the rack using four "A" screw (included).



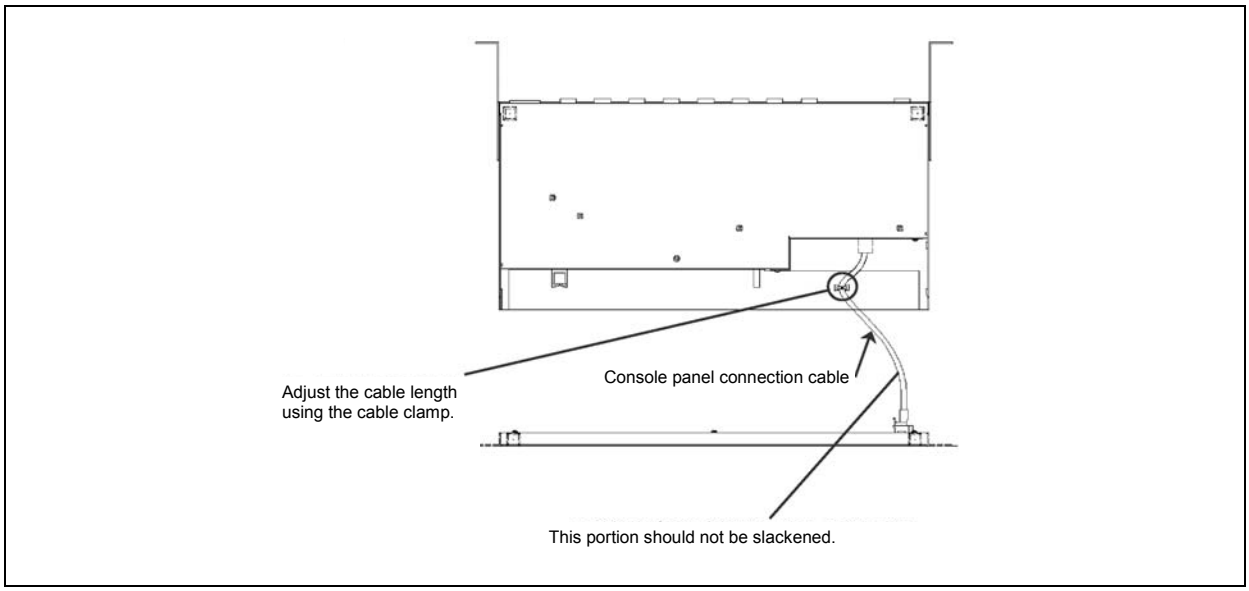
7. Fix the rear panel onto the rear side of the rack using four "A" screw (included).



8. Connect the console panel connection cable located at the rear bottom side of the console panel.

9. Place the attached cable clamp at an appropriate location at the back side of the server switch unit and then fix the operation panel connection cable so that it will not loosen.

INPORTANT： When the cable is fixed, note that excess tension may not be applied to the connector.



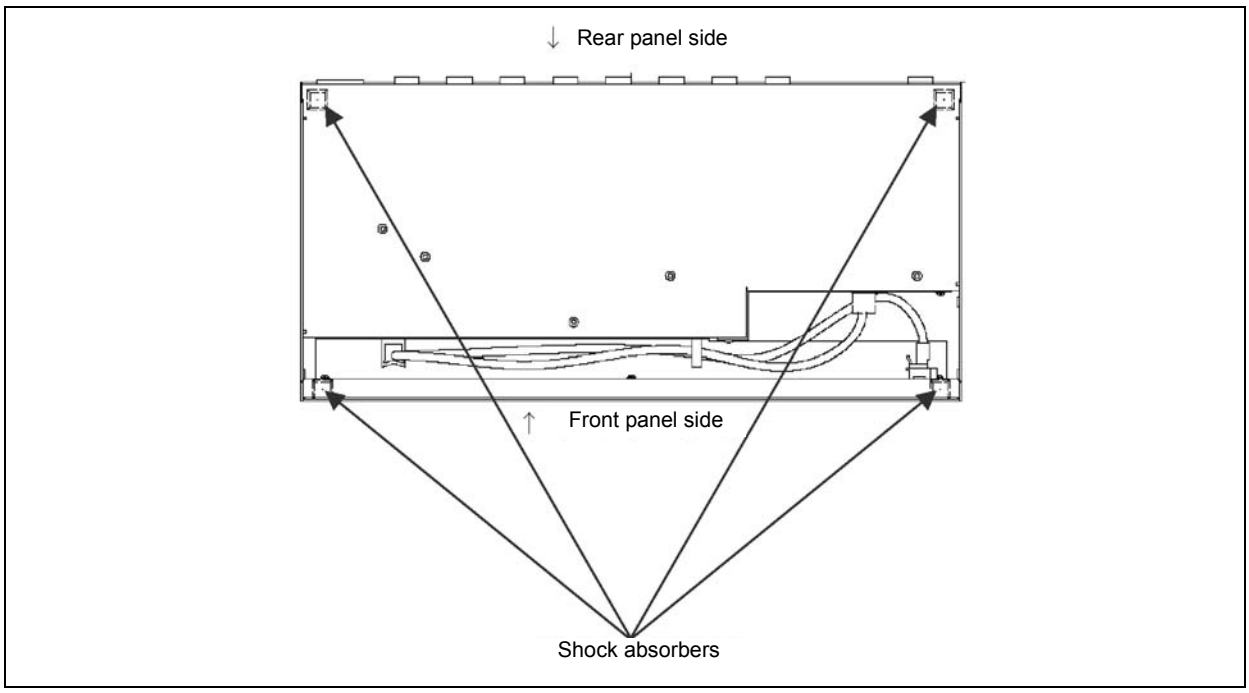
DESKTOP INSTALLATION OF THE SERVER SWITCH UNIT

The server rack should not be installed in places such as listed below. Installing the unit in such an area may result in the occurrence of a malfunction.

- Place of uneven or slanting floor.
- Place of drastic temperature change (near a heater, air conditioner, or refrigerator)
- Place which much dust.
- Place where intense vibration may be generated
- Place where corrosive gases (sulfur dioxide, hydrogen sulfide, nitrogen dioxide, chlorine, ammonia, ozone, etc.) exist.
  Place where the air (or dust) includes components accelerating corrosion (ex. sulfur, sodium chloride) or conductive metals.
  Place where chemicals are nearby, or chemicals may be sprayed accidentally.
- Place where a carpet not subject to anti-static process is laid.
- Place where some objects may be fallen on the server switch unit.
- Place near a device generating intense magnetic field (such as a TV, radio, broadcast/communication antenna, power transmission wire, and electromagnetic crane) is placed (If unavoidable, contact your service representative to request proper shield construction.)
- Place where the power cord of the server switch unit must be connected to an AC outlet that shares the outlet of another device with large power consumption.
- Place near equipment that generates power noise (e.g., contact spark at power-on/power-off of commercial power supply through a relay). If you must install the server switch unit close to such equipment, request your service representative for separate power cabling or noise filter installation.

- Where the AC cord of the server switch unit must be connected to an AC outlet which is being shared with other devices of large power consumption.

NOTE：Attach four rubber feet (shock absorber) to the bottom of the server switch unit when installing for desktop use, as shown in the figure below.



CABLE CONNECTION

⚠ WARNING

Observe the following instructions to use the server and peripheral devices safely. Failure to follow these instructions may result in death or serious personal injury. See pages iii to xvi for details.

- Do not touch the power plug and connectors while your hands are wet.

⚠ CAUTION

Observe the following instructions to use the server and peripheral devices safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages iii to xvi for details.

- Do not connect any interface cable with the server being powered or the power cord being connected.
- Do not use any unauthorized power cord and/or interface cable.
- Always plug in to a proper power source.
- Do not connect the power cord to an outlet that has an illegal number of connections.
- Insert the power plug into the outlet as far as it goes.

The server switch unit is connected with a server through the K410-118 or K410-119 cable sold separately.
The K410-118 cable has a USB connector and a LCD connector on one end, and D-Sub 15-pin connector on the other end. The K410-119 cable has two PS/2 connectors (for keyboard and for mouse, distinguished by different colors and icons) and a LCD connector on one end and D-Sub 15-pin connector on the other end.
Use the dedicated cables listed below to connect the server switch unit with the server.

Name	Part Number	Remarks
Server switch unit USB connection cable set (1.8 m)	K410-118(1A)	Used to connect the server to the server switch unit via USB connection.
Server switch unit USB connection cable set (3.0 m)	K410-118(03)	Used to connect the server to the server switch unit via USB connection.
Server switch unit USB connection cable set (5.0 m)	K410-118(05)	Used to connect the server to the server switch unit via USB connection.
Server switch unit PS/2 connection cable set (1.8 m)	K410-119(1A)	Used to connect the server to the server switch unit via PS/2 connection. Always use this cable between master and slave sides in cascade connection.
Server switch unit PS/2 connection cable set (3.0 m)	K410-119(03)	Used to connect the server to the server switch unit via PS/2 connection.
Server switch unit PS/2 connection cable set (5.0 m)	K410-119(05)	Used to connect the server to the server switch unit via PS/2 connection.

SIMPLEX CONNECTION –CONNECTING WITH EIGHT OR LESS SERVERS

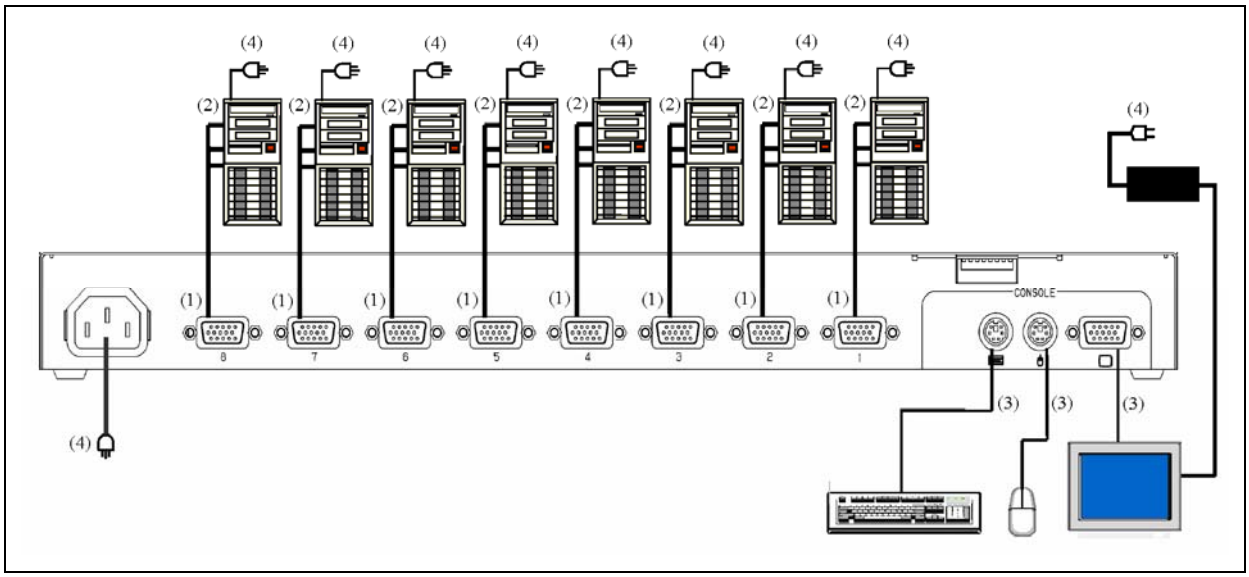
NOTE： Connectors

Make sure the shape of connectors before connection. The server port connector and LCD connector of the server switch unit have the same shape. You can distinguish them with its color and icon. The server port connector is black and marked with ▢. The LCD connector is blue and marked with numerics of 1 to 8. Pay attention not to connect the LCD connector to the server port.

INPORTANT： Notes on connecting cables

- Be sure to power off the server switch unit, servers, and peripheral devices before connection. Connecting cables with these devices being powered may cause a malfunction or a failure.
- Plug in the keyboard and mouse with "Δ" on the connector upward.
- Firmly secure the LCD connector (Mini D-Sub 15-pin) with screws to the server switch unit and the server. Loose cable connection may cause the screen display to be shifted or not to appear.

Take the following steps to connect cables.



When connecting with 8 Servers

1. Connect the keyboard/mouse and display connectors of the first server through the dedicated cable (K410-118 or K410-119) to the server switch unit, connecting first the server switch unit side, then the server side. ((1), (2) in the figure above).

   NOTE：It is recommended to attach a label to the cable with connector name and destination device name filled in. It is useful when installing, relocating, or cleaning the unit.

2. Connect servers two to eight as necessary. ((1), (2) in the figure above).

   NOTE：Connect the interface cable to the server switch unit side first, then the server side.

3. When all servers are connected to the server switch unit, connect the keyboard, mouse, and the display units to the KB, MOUSE, and CONSOLE connectors. ((3) in the figure above.)

4. Finally, connect the power cords of the servers and display unit and the AC cord of the server switch unit into the AC outlet. ((4) in the figure above)

   NOTE：Fix the cable of the AC cord with the attached tie wraps to the rack mount bracket(large) or an appropriate location on the rack to prevent disconnection.

5. Fix the cables to the rack with the attached tie wraps.

6. After confirming that all the connections are properly in place, power ON the servers sequentially. Select each of the servers to confirm that it has started normally and is set correctly.

7. If the keyboard, mouse, and/or display monitor are not set correctly, set and start each device again.

CASCADE CONNECTION –CONNECTING WITH NINE OR MORE SERVERS

NOTE： Connectors

Make sure the shape of connectors before connection. The server port connector and LCD connector of the server switch unit have the same shape. You can distinguish them with its color and icon. The server port connector is black and marked with ▢. The LCD connector is blue and marked with numerics of 1 to 8. Pay attention not to connect the LCD connector to the server port.

INPORTANT： Notes on connecting cables

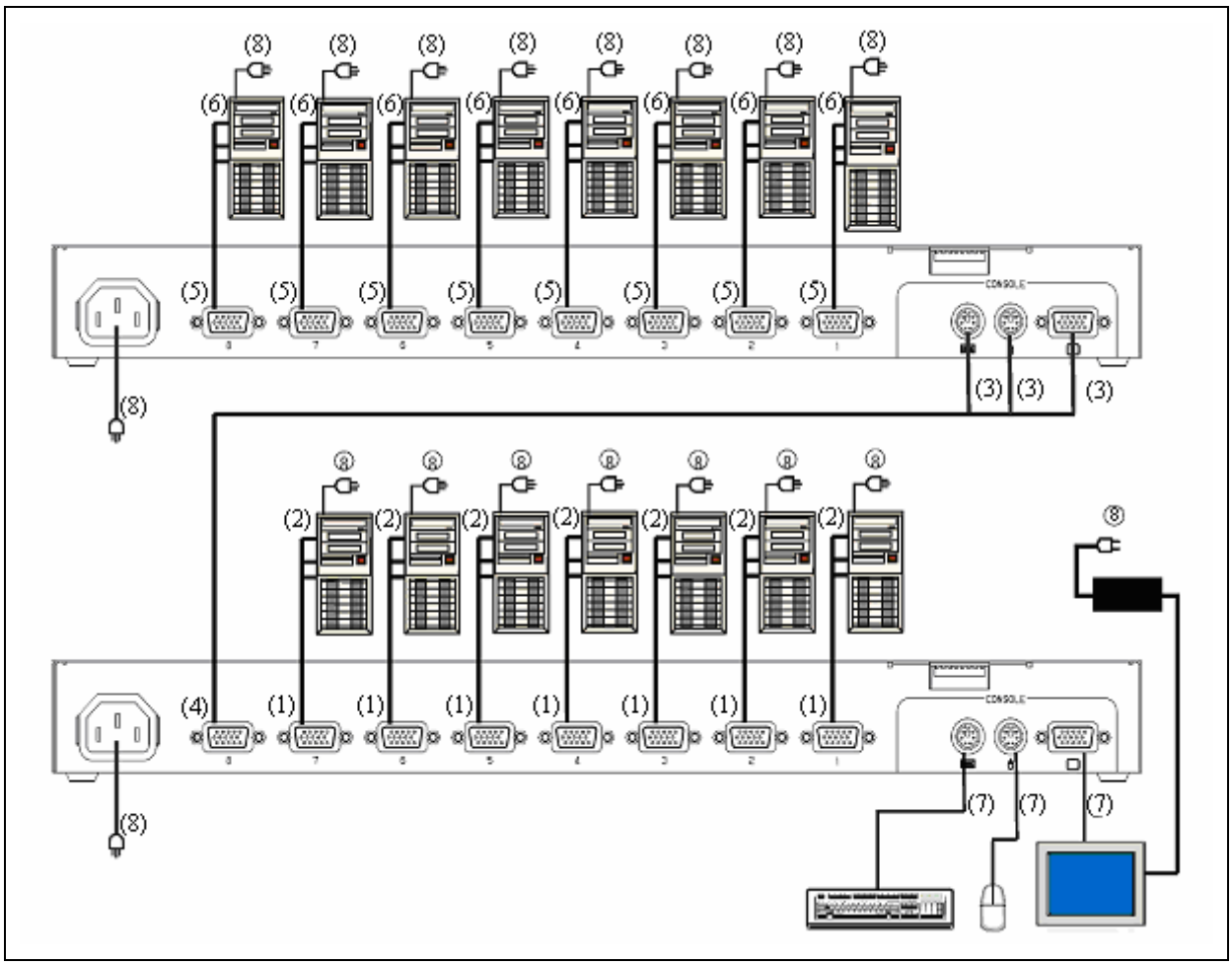
- Be sure to power off the server switch unit, servers, and peripheral devices before connection. Connecting cables with these devices being powered may cause a malfunction or a failure.
- Plug in the keyboard and mouse with "Δ" on the connector upward.
- Firmly secure the LCD connector (Mini D-Sub 15-pin) with screws to the server switch unit and the server. Loose cable connection may cause the screen display to be shifted or not to appear.

You can add N8191-10F server switch unit by using the dedicated connection cable (K410-119 (1A)) to each server port of the server switch unit or N8143-69 console unit. Such the connection is called cascade connection.

With eight N8191-10F server switches in cascade connection, you can select a console from up to 64 servers. In cascade connection, the installation area can be greatly reduced since it requires only one console.

The N8191-10F server switch unit in which the console is connected is called the "master", and the N8191-10F server switch units connected to each port of the master unit are called "slaves".

A sample construction is illustrated shown below: the server switch unit is installed in a rack and 15 servers are connected in the cascade.



When connecting with 15 servers

1. Connect seven servers to the ports 1 through 7 of the master server switch unit according to the procedures in "SIMPLEX CONNECTION –CONNECTING WITH EIGHT OR LESS SERVERS" described earlier. (Connection (1),(2) in the figure above.).
   Power cords for the server switch unit, the servers, and the console must be connected later.

   NOTE：
   ■ It is recommended to attach a destination label to the cable with connector name and destination server name filled in. It is useful when installing, relocating, or cleaning the unit.
   ■ Do not use any other power cord than provided with the server switch unit.

2. Connect the eight port of the master server switch unit to the Keyboard, Mouse, and Console connectors (console port) of the slave unit using the dedicated cable (K410-119(1A)), connecting the slave side first (Connection (3),(4) in the figure above.).

   NOTE：Cable for cascade connection
   In cascade connection, only the cable K410-119(1A) can be used.

3. Connect the remaining eight servers to the slave server switch unit according to the procedures in "SIMPLEX CONNECTION –CONNECTING WITH EIGHT OR LESS SERVERS" described earlier (Connection (5),(6) in the figure above.).

   NOTE：
   ■ If the addition of more slave units is desired, repeat steps 1 through 3 described above. Use ports 7, 6, 5,…., 1 of the master server switch unit in reverse order when adding slave units.

   INPORTANT：
   The slave server switch unit can not be cascaded with another (the third) slave unit.

4. After completing the connections of the server switch unit with the servers, connect the keyboard, mouse, and display unit to the Keyboard, Mouse, and Console connectors of the master server switch unit(Connection (7) in the figure above.).
5. Finally, connect the power cords of the servers and the display unit and the AC cord of the server switch unit to the AC outlet (Connection (8) in the figure above.)
6. Fix the dedicated cables and AC cords with the attached tie wraps.
7. After confirming that all the connections are properly in place, power ON the servers sequentially.
8. If the keyboard, mouse, and/or display monitor are not set correctly, set and start each device again.

CONNECTING WITH UPS

It is recommended that, if the power of the servers connected to the server switch unit is supplied from a UPS (uninterruptible power supply), the power of the server switch unit is supplied from the UPS.

IMPORTANT： Connect the server switch unit with UPS having the highest boot priority within the system. If any server connected to the server switch unit starts in prior to the server switch unit, the server switch unit may fail to operate correctly.

SETTINGS FOR MOUSE ON REDHAT LINUX 7.2

When connecting the server switch unit to the server on which RedHat Linux 7.2 is installed via the dedicated cable K410-118, RedHat Linux 7.2 may fail to detect the mouse device.

In such a case, change the settings of RedHat Linux 7.2 as described below.

1. Check if the symbolic link for the device has been created on the shell prompt. (Type the underlined character strings.)

   [root@localhost]# ls -l /dev/mouse <Enter>

   If the message "No such file or directory" appears, create the symbolic link as shown below.

2. Create the symbolic link for the mouse device.

   [root@localhost]# cd /dev <Enter>

   [root@localhost]# ln -s input/mice mouse <Enter>

   NOTE： You need to log in the system as the user with administrator authority (root) to create the symbolic link.

CHAPTER 2

USING THE SERVER SWITCH UNIT

This section describes the fundamental operations of the server switch unit.

SWITCH OF SERVER SWITCH UNIT

A specified server can be selected in two ways, the use of the server selection switch and the use of the keyboard (hot key).

If the server of the port being selected is off-powered, the selection remains unchanged. The server switch unit does not automatically select another server. In such a case, use the server selection switch or hot-key to select another server.

Keyboard and mouse are enabled only for the server connected to the selected port. Any other servers do not accept data sent from the keyboard and/or mouse.

However, command processing between the server switch unit and every server is continuously performed. Accordingly, the mode (e.g., key code mode, LED status, and mouse output mode) specified for the server becomes valid when the server is selected.

SELECTING SERVER AT POWER ON

While all the servers are off-powered and only a single server is powered on, the server is selected automatically and connected to the server switch unit.

If all the servers are powered on simultaneously, the selection priority is determined by the ascending order of the port number (port 1 is the highest, port 8 is the lowest).

SELECTION OF SERVER VIA SERVER SELECTION SWITCH (NORMAL MODE)

To select a server, press the server selection switch of the desired server. When the server is selected, the server selection lamp of the designated server will light. The name of the selected server will be displayed in the upper left corner of the screen for approximately three seconds. In a cascade connection, the desired server can be selected by pressing the switch on the desired slave server switch unit, or by pressing the switch on the master server switch unit and then pressing the switch on the slave unit.

By pressing the auto scan switch, the server selection lamp will blink at a slow rate and the display screen will automatically be switched from one server to the next in the specified time cycle. At this time, the console will display the switching cycle. To modify the switching rate, press the ↑ or ↓ keys. Pressing the ↑ key will set the switching rate to be faster, while pressing the ↓ key will set the switching rate to be slower. Whenever either of the ↑ and ↓ keys are pressed, the switching period will be toggled between 3, 5, 10 (initial value), 20, 40 and 60 seconds. Any server with the power being OFF will be skipped. During the auto scan, key entries to the servers and mouse will be unavailable. Before the server switch unit can be moved to the hot key mode, auto scan must be terminated.

Auto scan can be terminated by either of the following methods:

Press the auto scan switch or the **Enter** key. The screen will be then switched to that of the currently displayed server.

Press the **Esc** key. The server which was selected prior to the auto scan will be selected.

NOTE： The auto scan function is unavailable while the server is booting. If you erroneously pressed the auto scan key, cancel, and select a server using the server selection key.

SELECTION OF SERVER ON KEYBOARD (HOT KEY MODE)

You can select a server using a keyboard (in hot-key mode).

There are two hot-key modes; OSD (On Screen Display) selection mode and direct selection mode. When the server switch unit enters the hot-key mode, the OSD screen appears on the console. The Scroll Lock LED on the keyboard blinks rapidly, and the other LEDs (Num Lock LED, Caps Lock LED) are turned off.

Keyboard and mouse operation for the server are disabled during hot-key mode.

If the server switch unit enters OSD mode while the selected server is in suspended status (no image signal (H Sync or V Sync) is sent from the server), the image signal of the other server is used to display the OSD menu. In this case, the OSD menu flashes at interval of 5 seconds. The OSD menu returns to normal state when the image signal is input to the selected port.

NOTE： You cannot enter the hot key mode while key entry is disabled (e.g., during OS start up). Wait until key entry to the server is available, and retry to enter hot key mode.
If any key is pressed during OS startup, the server selection switch on the console panel will be disabled. Press the reset switch to restart the server switch unit, and then press the server selection switch once again.

NOTE： Hot key mode is enabled while the DIP switch settings 1 to 3 are ON. If you can't operate the hot key feature, check the DIP switch settings.

ENTERING OSD SELECTION MODE

In the OSD Selection mode, you can select a server by using the keyboard in one of the following procedures:

- Pressing the **Ctrl**, **Alt**, and **Shift** keys simultaneously.
- Pressing the **Scroll Lock** key twice quickly.

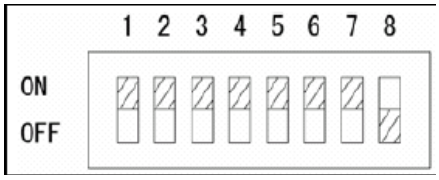
ENTERING DIRECT SELECTION MODE

In the Direct Selection mode, you can select a server by using the keyboard in one of the following procedures:

- Pressing the **Ctrl** key twice quickly.

ENABLE/DISABLE HOT-KEY MODE

Hot keys can be enabled or disabled by changing of DIP switch setting on the rear of the server switch unit.

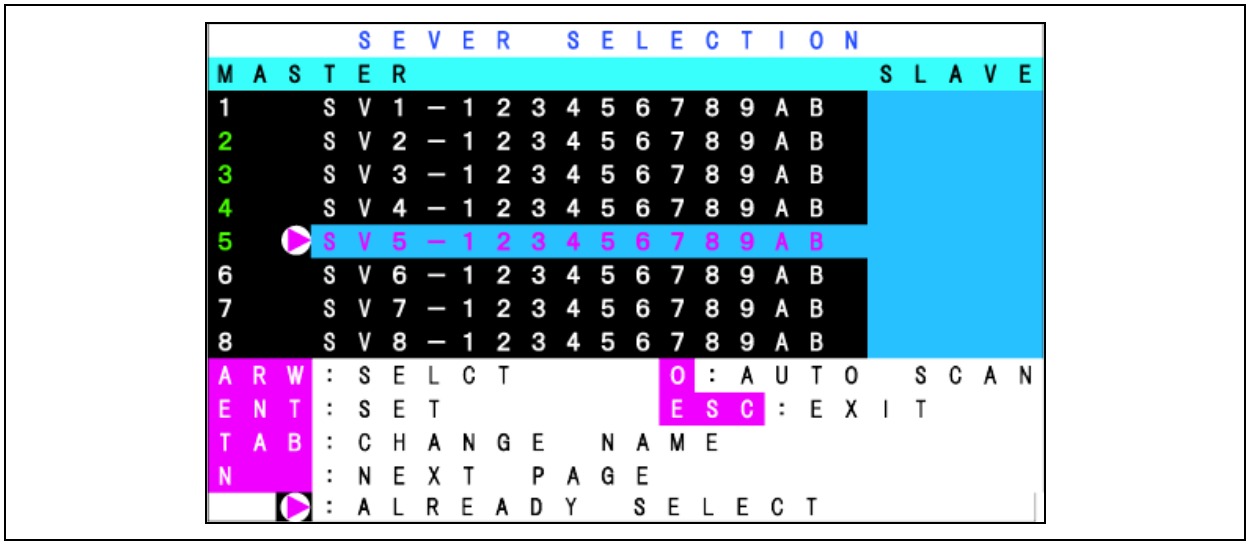


SW No	Description	Default setting
SW1	Enables/disables the hot-key [Ctrl+Alt+Shift] and the Hot-Key switch.	[ON] [Enabled]
SW2	Enables/disables the hot-key [Ctrlx2].	[ON] [Enabled]
SW3	Enables/disables the hot-key [Scroll Lockx2].	[ON] [Enabled]

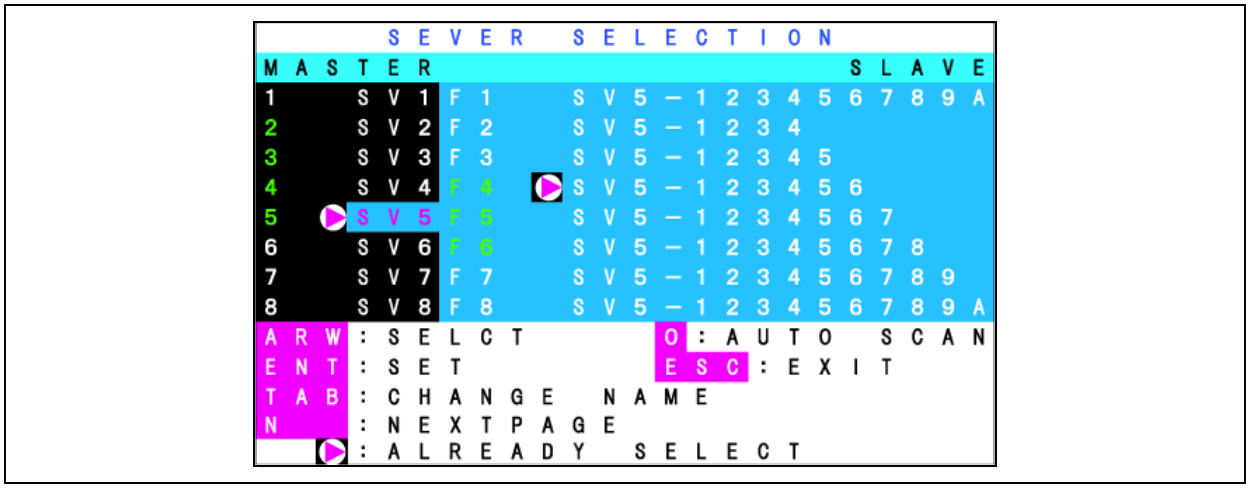
Note:See “DIP Switch”for any other setting.

WHEN ENTERED HOT-KEY MODE IN OSD SELECTION MODE:

If you enter the hot-key mode in OSD selection mode, the OSD selection screen appears on the server screen.


SEVER SELECTION
MASTER
SLAVE
1 SV1 – 1 2 3 4 5 6 7 8 9 A B
2 SV2 – 1 2 3 4 5 6 7 8 9 A B
3 SV3 – 1 2 3 4 5 6 7 8 9 A B
4 SV4 – 1 2 3 4 5 6 7 8 9 A B
5 SV5 – 1 2 3 4 5 6 7 8 9 A B
6 SV6 – 1 2 3 4 5 6 7 8 9 A B
7 SV7 – 1 2 3 4 5 6 7 8 9 A B
8 SV8 – 1 2 3 4 5 6 7 8 9 A B
ARW : SELCT
O : AUTO SCAN
ENT : SET
ESC : EXIT
TAB : CHANGE NAME
N : NEXT PAGE
: ALREADY SELECT

Sample Indication on OSD Screen of server switch unit


SEVER SELECTION
MASTER
SLAVE
1 SV1 F1 SV5 – 1 2 3 4 5 6 7 8 9 A
2 SV2 F2 SV5 – 1 2 3 4
3 SV3 F3 SV5 – 1 2 3 4 5
4 SV4 F4 SV5 – 1 2 3 4 5 6
5 SV5 F5 SV5 – 1 2 3 4 5 6 7
6 SV6 F6 SV5 – 1 2 3 4 5 6 7 8
7 SV7 F7 SV5 – 1 2 3 4 5 6 7 8 9
8 SV8 F8 SV5 – 1 2 3 4 5 6 7 8 9 A
ARW : SELCT
O : AUTO SCAN
ENT : SET
ESC : EXIT
TAB : CHANGE NAME
N : NEXT PAGE
: ALREADY SELECT

Sample Indication on OSD Screen when Selected Port Connected in Cascade

DESCRIPTION OF SCREEN

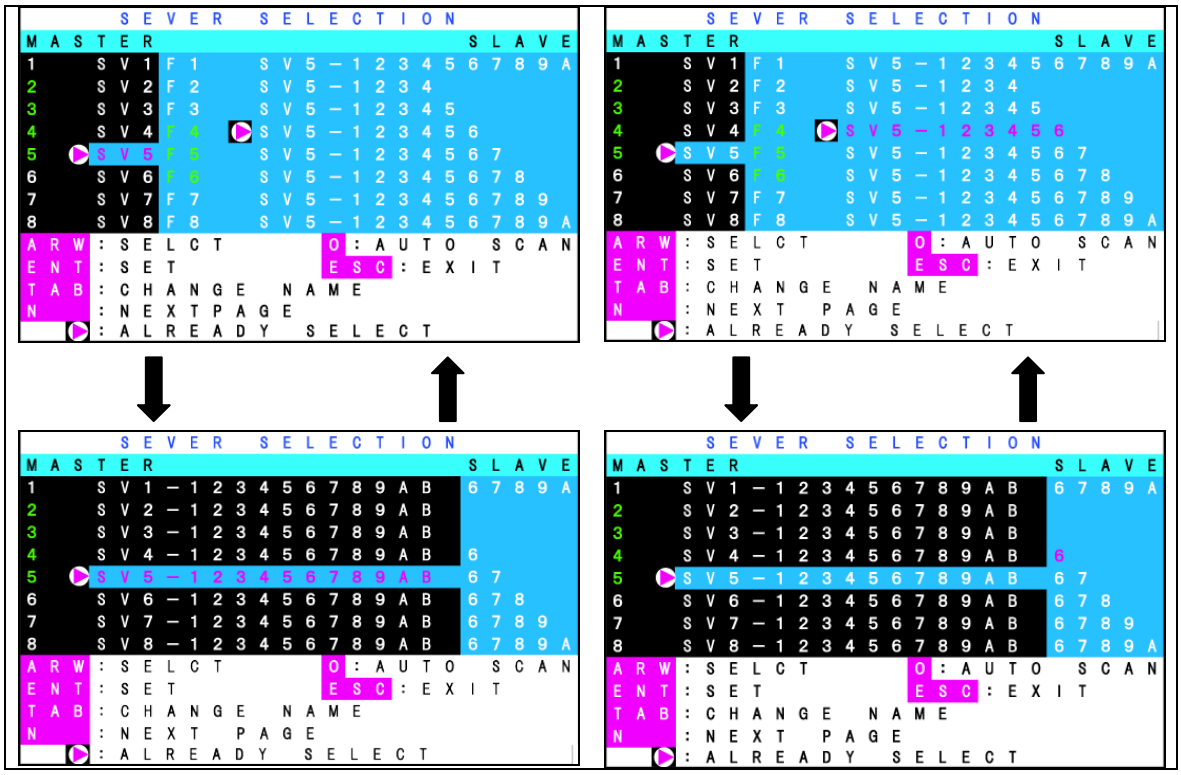
1. The status of the master server switch unit appears at the left side of the screen with black background.
2. The status of the slave server switch unit (connected with the server switch unit in cascade) appears at the right side of the screen with blue background.
3. The purple character strings with blue background indicate port for the server you are going to select by the cursor key. Move the cursor by <↑> or <↓> key to select a server and press <Enter> to determine it. To move the cursor between the master and slave sides, use <←> or <→> key.
4. The key guidance is described simply at the bottom of the screen.
5. The server marked by is now selected.
6. The server name of up to 15 characters is displayed.

   (In the OSD screen example, the server name is indicated as "SVn-123456789AB". Where, n represents port number (1 to 8).
7. The server with green numerals (1 to 8 for master unit, or F1 to F8 for slave unit) indicates that the server is powered on. The server with white numerals indicates that the server is off-powered or not connected.
8. The display of OSD screen will change to either of the following depending on whether the port selected on master side is connected in cascade or not.

   – When the selected port is not in cascade connection, 14 characters are displayed on master side and nothing is displayed on slave side. (The OSD screen is the same as that of non-cascade connection.)

   – When the selected port is in cascade connection, 3 characters are displayed on master side and 14 characters are displayed on slave side.

9. When you select a port which is in cascade connection on the master side screen, or select a port on slave side screen and press the <Shift> key, 14 characters are displayed on master side and 5 characters on slave side. Releasing the <Shift> key will return to the original display.



Left: When a port in cascade connection is selected on master side
Right: When a port is selected on slave side

NOTE： While the Shift key is pressed, any other key entries are disabled.
If nine or less characters are registered for slave side though up to 14 characters can be registered (lower five digits are blank, as shown in example of port 2 in the figure above), the server name of the slave side will not be displayed when the Shift key is pressed to display the server name of master side.

SELECTING SERVER IN OSD SELECTION MODE

SELECTION USING KEYBOARD

1. Select a port of the server switch unit on the master side of the OSD screen by using cursor keys (↑and ↓).
2. If the slave server switch unit is connected to the selected port in cascade, the status of the server subject to the cascade connection appears on the slave side of the screen.
3. If the selected port is subject to the cascade connection and when you press the cursor key →, the character string in the cascade state display section on the slave side of the screen is displayed purple to make it valid. If you press the cursor key ←, the pointer returns to the master side of the screen.
4. On the slave side screen, use the cursor keys ↑ and ↓ similarly to select a port.
5. When you press the Enter key on OSD screen, the port on which the cursor is placed is selected. After the switching, the name of the server newly selected appears at the upper left corner of the LCD screen for about three seconds.

   Press the Esc key on OSD screen to exit from the hot key mode without the switching. Then the port which has been selected before entering the hot-key mode is selected again.

> **NOTE：** To select a server using keyboard in OSD selection mode when the server switch unit is in cascade connection with slave server switch unit, be sure to select a port on master side first, then a port on slave side.

DIRECT SELECTION WITH KEYBOARD IN OSD SELECTION MODE

You can select a server by pressing the proper one of the 1 to 8 keys o OSD screen.

In the cascade connection with slave server switch unit, select the master side by pressing the proper one of the 1 to 8 keys and the slave side by pressing the appropriate one of the F1 to F8 keys. The key operation enables selection of the server directly using the keyboard.

Selecting a server automatically exits from the hot-key mode, and the name of the selected server is displayed on upper left of LCD for 3 seconds.

> **NOTE：** To select a server using keyboard in OSD selection mode when the server switch unit is in cascade connection with slave server switch unit, be sure to select a port on master side first, then a port on slave side.

SELECTION WITH MOUSE IN OSD SELECTION MODE

You can use the scroll-mouse to select a port.

1. On the master side of OSD screen, move the mouse cursor to the desired port. The mouse scroll <Scroll-Up> corresponds to the <↑>, and <Scroll-Down> to the <↓>.
2. When you move the mouse cursor to the port that is connected with the slave server switch unit in cascade, the status of the server switch unit is displayed on the right side of the OSD screen.
3. When you press the <Right> button at the port that is connected with the slave server switch unit in cascade, the cursor moves to the slave side of the OSD screen. The server name of the port on which the cursor is placed is displayed in purple. To move from slave side to master side, press the <Left> button.
4. When the cursor is placed in the slave side of OSD screen while the server switch unit is in cascade connection with slave server switch unit, use the scroll buttons to move the cursor vertically as well as in master side.
5. Pressing the <Right> and <Left> buttons simultaneously selects the port on which the cursor is placed. Selecting a server automatically exits from the hot-key mode, and the name of the selected server is displayed on upper left of LCD for 3 seconds.

NOTE： To select a server using mouse in OSD selection mode when the server switch unit is in cascade connection with slave server switch unit, be sure to select a port on master side first, then a port on slave side.

ENTERING HOT-KEY MODE IN DIRECT SELECTION MODE

When you enter the hot-key mode in direct selection mode, the OSD menu appears on upper left of the LCD screen.

Normal Screen (Stationary Display)

Direct Selection Mode

OSD MENU IN DIRECT SELECTION MODE

1. The OSD menu appears on upper left of the LCD screen (the same location as for server name display, with red background) indicating the status of server switch unit.

> **NOTE：** The server name used for port selection is displayed in blue background. In the OSD menu, the background is red.

2. When the port is selected, the background color changes to blue. Selecting the server exits from hot-key mode. By the default, the server name disappears about 3 seconds later.

> **NOTE：** If the stationary display feature is enabled, the server name remains on the screen even after 3 seconds has passed (with blue background).

SELECTING SERVER IN DIRECT SELECTION MODE

1. You can select a server by pressing the proper one of the 1 to 8 keys in direct selection mode (characters are displayed with red background). Keys 1 to 8 correspond to the port number.
2. If you want to select a server in the slave side in the cascade connection with slave server switch unit, select the master side by pressing the proper one of the 1 to 8 keys and the slave side by pressing the appropriate one of the F1 to F8 keys. Then the desired port can be selected directly.

> **NOTE：** To select a server using the keyboard in direct selection mode when the server switch unit is in cascade connection with slave server switch unit, be sure to select a port on master side first, then a port on slave side.

3. Selecting the server exits from the direct selection mode.
4. You can also exit from the direct selection mode by pressing the <Esc> or <Enter> key.

AUTO SCAN MODE (COMMON TO OSD SELECTION MODE/DIRECT SELECTION MODE)

Keyboard and mouse operation are disabled during Auto Scan mode.

5. If you press the <0> (zero) key on OSD screen, the screen display is automatically switched in a certain period.
6. The screen display is switched in ascending order of the port number. When the screen goes to port 8, then returns to port 1.

   For auto scan sequence in cascade connection, the ports of slave server switch unit are included in the port of the master side.

   For example, when the ports 1 to 6 of the master side are connected with servers and ports 7 and 8 are connected with the slave server switch units in cascade and each the server switch units is connected with 8 servers, the auto scan sequence as follows:

   Port 1 to 6 → F1 to F8 of port 7 → F1 to F8 of port 8 → Port 1
7. Any server with the power being off is skipped.
8. On the location where the server name is displayed, the character string "Auto Scan" appears after displaying the switching rate.

   To change the switching rate, use the <↑> or <↓> key. Pressing the <↑> key allows the switching rate to be faster, while pressing the <↓> key enables the switching rate to be slower. Whenever you press either of the <↑> or <↓> key, you can select the switching period among 3, 5, 10 (default), 20, 40 and 60 seconds.

   The character string "Auto Scan" appears while in the Auto Scan mode.
9. During the auto scan, any key entries to the servers and mouse operations are unavailable.
10. Before entering the hot-key mode, the auto scan mode must be terminated.
11. The auto scan mode is terminated by either of the following methods:
    - Press the Enter key. Then the port is switched to that displayed currently.
    - Press the Esc key. Then the port selected at the start of Auto Scan is selected again.

DISPLAY/HIDE THE SERVER NAME

The server name can be continuously displayed on the upper left corner of the screen, or hidden. To display the server name, press the Scroll Lock key twice while holding down the Shift keys in normal operation of the server (except for Hot Key mode or Auto Scan mode).
To hide the server name, press the Scroll Lock key twice while holding down the Shift keys while the server name is continuously displayed.

NOTE： Default setting for display/hide the server name:

- The initial state of the server switch unit is to hide the server name.
- The server name is not displayed in hot-key mode.
- The display/hide feature cannot be set while in hot-key mode.
- The display/hide feature is remained valid if any other server is selected in hot-key mode.
- The display/hide feature is also valid when the server connected to the slave side is selected in cascade connection with slave server switch units.

REGISTRATION OR CHANGE OF SERVER NAME

1. Enter the hot-key mode in OSD selection mode (press the Hot-Key button, press the <Ctrl> + <Alt> + <Shift> keys, or press the <Scroll Lock> key twice).
2. Move the cursor to the port for the server you are going to register or change the name.
3. Press the <Tab> key.
4. The color of the character string is changed to yellow but only a single character has the yellow background.
5. Type the name on the keyboard and press the <Enter> key. Then the name is registered or changed.

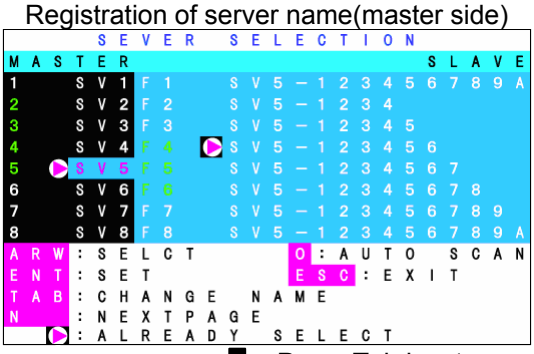
   Press the <Del> key to delete the single character at which the cursor is located. Press the <BS> key to move the cursor backward.

   Press the <Esc> key to cancel the registration. Then the display returns to the screen having appeared before the registration is started.
6. Up to 14 characters can be used for server name.

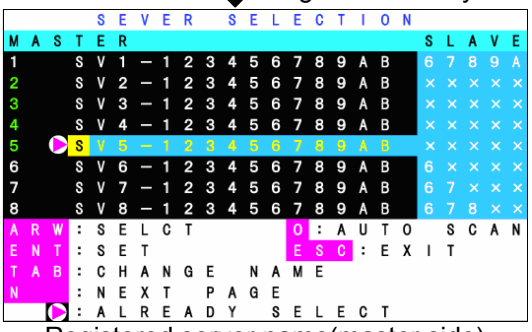
   Available characters are:

   ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890 , . / [ ] ; + × – + and <Space>.

Registration of server name(master side)

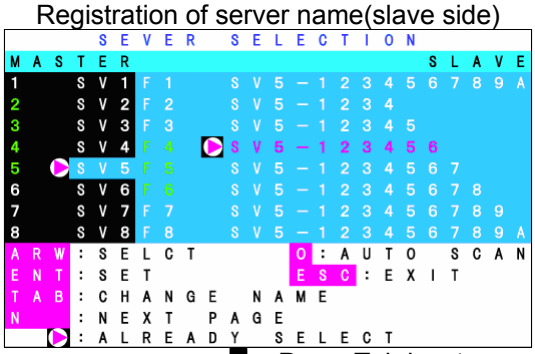


Press Tab key to register the entry.

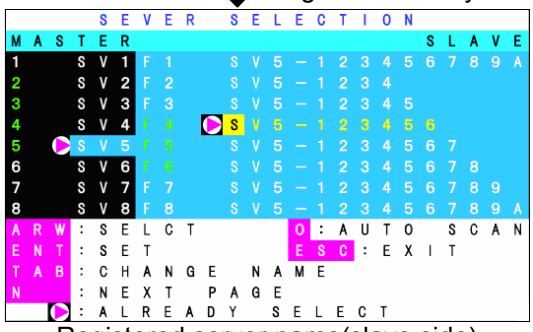


Registered server name(master side)

Registration of server name(slave side)



Press Tab key to register the entry.



Registered server name(slave side)

SETTING OF CONSOLE INFORMATION

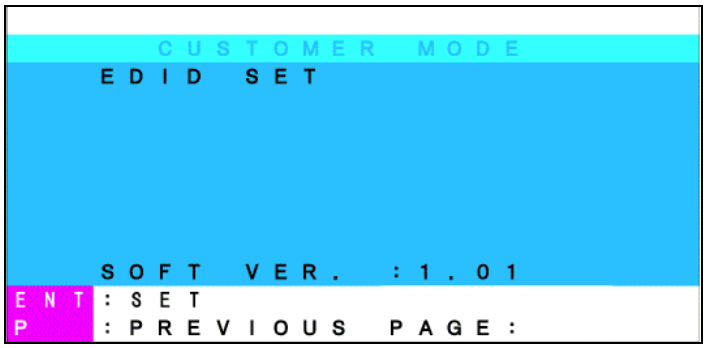
The console information of factory-installed Default-Monitor is set as default in every port of the server switch unit.

Setting of console information in the server switch unit is required when connecting the slave server switch units in cascade.

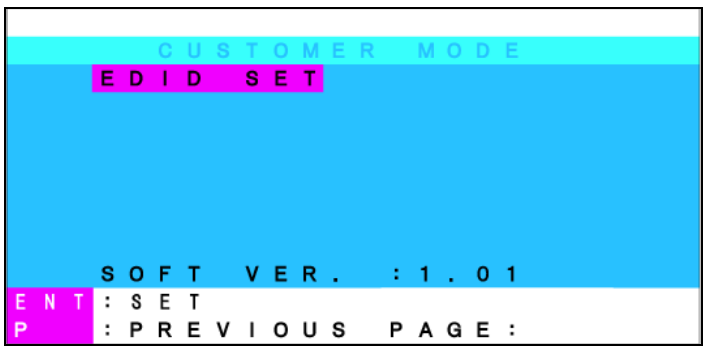
Also, if you replace the LCD with the standard one, console information must be set in the server switch unit

> **NOTE：** For any other LCD than the standard one, the LCD is recognized as either of "PnP Monitor" or "Default Monitor" depending on the LCD type. The optional LCD dedicated to NEC Express server is recognized as "PnP Monitor". If the LCD is recognized as "Default Monitor", check cable connection between the server switch unit and the optional LCD.

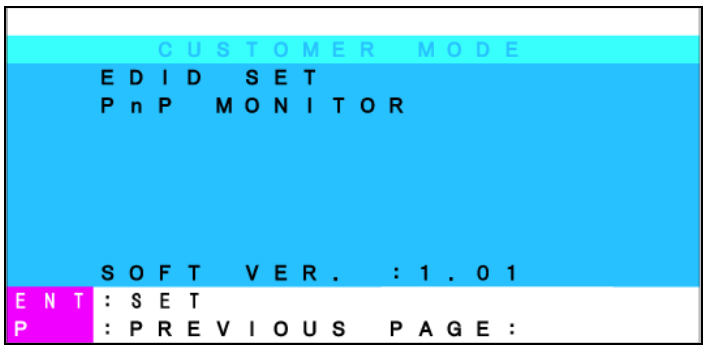
1. Select and start one of the servers on ports 1 through 8. (You can set information by starting a single server only.)
2. Enter the hot-key mode in OSD selection mode (press the <**Ctrl**> + <**Alt**> + <**Shift**> keys, or press the <**Scroll Lock**> key twice).
3. Press the <**N**> key to enter customer mode.



4. If you press the <**Enter**> key, the background color of EDIT SET on the screen changes to purple.



5. Make sure that the background color of EDIT SET returns to blue, and then the [PnP Monitor] or [Default Monitor] is displayed on the screen.



6. Press the <**P**> key to exit the customer mode, and then press the <**Esc**> key to exit the hot-key mode.

7. Restart all servers connected to the server switch unit.

CHAPTER 3

MAINTENANCE

This section describes how to maintain the server switch unit.

DAILY MAINTENANCE

To use the server switch unit in good condition, regularly check and maintain the unit as described below. If the server switch unit is assumed as faulty, immediately contact your service representative.

⚠ WARNING

Observe the following instructions to use the server and peripheral devices safely. Failure to follow these instructions may result in death or serious personal injury. See pages iii to xvi for details.

- Do not disassemble, repair, or alter the server switch unit.
- Disconnect the power cord before working with the server switch unit.

CLEANING

Clean the server switch unit on a regular basis to keep the unit running properly.

CLEANING THE UNIT

For daily cleaning, wipe the external surfaces of the server switch unit with a dry soft cloth. Follow the procedure below if stains remain on the surfaces:

IMPORTANT：

- To avoid altering the material and color of the server switch unit, do not use volatile solvents such as thinner and benzene to clean the unit.
- The power receptacle, the cables, the connectors on the rear panel of the server switch unit, and the inside of the server switch unit must be kept dry. Do not moisten them with water.

1. On the OSD screen, make sure that all the servers are powered off.
2. Unplug the power cord of the server switch unit from the power outlet.
3. Wipe off dust from the power cord plug with a dry cloth.
4. Soak a soft cloth in neutral detergent that is diluted with cold or lukewarm water, and squeeze it firmly.
5. Rub off stains on the server switch unit with the cloth prepared in Step 4.
6. Soak a soft cloth in water, squeeze it firmly, wipe the server switch unit with it again.
7. Wipe the server switch unit with a dry cloth.

TROUBLESHOOTING

If the server switch unit does not seem to operate as desired, check the unit based on the check list described below before requesting repair. If symptoms match ones described in the list below, follow the check list and procedures described for the item.

If proper procedures do not appear below or the procedures do not improve the problem, contact your service representative.

The Power lamp blinks.

☑ Is the AC cord connected correctly?

→ Check that the AC cord is connected to the server switch unit and the AC outlet (or UPS) securely.

→ Check that the coating of the AC cord is not broken and/or the plug is not bent.

→ Check that the breaker for the AC outlet to which the AC cord is connected is set to ON.

→ If the AC cord is connected to a UPS, check that the power of the UPS is ON and that the power is being supplied from the UPS. Refer to the manual attached to the UPS for details.

The keyboard and/or mouse operate incorrectly or do not operate.

☑ Are the keyboard and mouse connected correctly to the keyboard and mouse connectors of the server, respectively?

→ Check that the keyboard and mouse are connected to the proper connectors on the server.

☑ Is the hot key mode released (the Server Selection lamp blinks)?

→ If no, press the <**Enter**> or <**Esc**> key to exit hot key mode.

☑ The keyboard and mouse for the server are set up correctly?

→ Check to see if the server is set up correctly. Refer to the user's guide attached to the server for details.

☑ Is the interface cable correctly connected?

→ Check the cable connection referring to Chapter 1 for details.

→ Check that the cable connector is not defective and that the connector pins are ~~is~~ neither bent nor dirt. If the cable is defective, contact your service representative to request a replacement of the cable.

☑ Are the keyboard and mouse supported on the NEC Express5800 server?

→ If the keyboard or mouse in use is not approved by NEC, the server switch unit may not operate normally. In this case, replace the keyboard and mouse with ones exclusively designed for the NEC Express5800 server.

☑ Are the settings for the mouse on RedHat Linux 7.2 correct?

→ Check the mouse settings for on RedHat Linux 7.2. See Chapter 1 for details.

The server does not start.

☑ Was the auto scan switch pressed during server startup?

→ Select a different server using the server selection switch, then reselect the desired server.

The scroll functions and buttons do not operate.

☑ Is the mouse being used approved for the NEC Express5800 server?

→ If the mouse being used is not approved by NEC it may not operate properly. Replace the mouse with one that is exclusively designed for the NEC Express5800 server.

☑ Is the proper driver installed in the server?

→ If not, install the proper driver. Refer to the user's guide attached to the NEC Express5800 server for details.

The display quality of the screen is deteriorated (including ghost and blur of characters).

☑ Is the interface cable connected correctly?

→ Check if either or both of the cable connectors are defective and if any connector pins are bent or dirty. If the cable is defective, contact your service representative to request a replacement of the cable.

Switching from a server to another causes the screen display to be shifted or not to appear.

☑ Is the resolution set correctly?

→ Check the resolution configured in the server and that of the display monitor. Refer to the user's guide attached to the server and that of the display unit for details.

☑ Is the console information correctly configured?

→ Check the resolution configured in the console. See Chapter 2 for details.

☑ Is the monitor synchronized with the server?

→ Check the synchronization configured for the display monitor. Refer to the user's guide attached to the display unit for details.

☑ Is the monitor in use approved for the NEC Express5800 server?

→ Unapproved monitors may display images incorrectly. In this case, use a multi-sync display monitor exclusively designed for the NEC Express5800 server.

The server switch unit can not enter auto scan mode.

☑ Is the server switch unit in hot key mode?

→ If no, enter the server switch unit into hot key mode referring to Chapter 2 and press the <**0**> (zero) key.

☑ Is the key entry correct?

→ If no, press the <**0**> (zero) key.

A server cannot be switched in hot key mode.

☑ Is the key entry correct?

→ Press the corresponding <**1**> to <**8**> keys for the desired server in the master unit then press the corresponding <**F1**> to <**F8**> keys for the desired server in the slave unit.

☑ Was a key pressed during OS startup?

→ Keys should not be pressed during OS startup. Reenter after OS has completed.

→ When a key is pressed during OS startup, the server selection switch on the console panel will be disabled. Press the reset switch to reset the server switch unit, then press the server selection switch once again.

The switching period of the auto scan is invalid.

☑ Is the switching period configured properly?

→ Modify the switching period correctly using the cursor keys (<↑> and <↓>).

When the power of a server is turned on, the server selection lamp does not light.

☑ Are the keyboard and mouse ports on the server working properly?

→ The keyboard and/or mouse ports on the server may be defective. Contact your service representative to ask for a repair of the ports.

☑ Is the interface cable correctly connected?

→ Check the cable connection referring to Chapter 1.

→ Check if either or both of the cable connectors are defective and if any connector pins are bent or dirty. If the cable is defective, contact your service representative to request a replacement of the cable.

The server switch unit does not recognize the cascade connection.

☑ Does the serve switch unit operate normally?

→ Press the reset switches on the server switch units to reset the units. Always press the reset switch of the master unit first then that of the slave unit. If the status remains unchanged, either or both of the server switch units may be defective. Contact your service representative to request the repair of the units.

The server switch unit becomes inoperable suddenly while under regular operation.

☑ Does the server switch unit operate normally?

→ Press the reset switch on the server switch unit to restart the unit. If the status remains unchanged, the server switch unit may be defective. Contact your service representative to request a repair of the unit.

The server switch unit cannot enter into hot key mode (OSD does not appear).

☑ Was a key pressed during OS startup?

→ Keys should not be pressed during OS startup. Reenter after OS has completed.

→ When a key is pressed during OS startup, the server selection switch on the console panel will be disabled. Press the reset switch to reset the server switch unit, then press the server selection switch once again.

☑ Is the screen saver feature of the server connected to the server switch unit enabled?

→ Check the server selection lamp on the server switch unit. If it is blinking, press the <**Esc**> key and move the mouse to disable the screen saver. If it is not blinking, move the mouse to disable the screen saver.

☑ Is the server connected to the server switch unit in sleep mode?

→ Cancel the sleep mode of the server.

Cannot input the desired character from the keyboard.

☑ Are any one of <**Ctrl**>, <**Alt**>, or <**Shift**> keys being pressed when the server selection switch was pressed?

→ Press any one of the <**Ctrl**>, <**Alt**>, or <**Shift**> keys, and reenter the desired character.

A vertical or horizontal line (noise) appears on the screen.

☑ Did you configured the fine adjustment?

→ Fine adjust the monitor according to user's guide of the display unit.

The message "OUT of Timing" is displayed on the screen. <Windows 2000>

☑ Is the console information configured correctly?

→ If the console information is not set correctly, the server may fail to detect the resolution of the monitor. See Chapter 2 for details.

☑ Check the monitor property.

→ Change the "Monitor Properties" of Windows 2000 as follows.
Select [Display Properties] - [Settings] - [Advanced...] - [Monitor] and remove the checkmark on [Hide modes that this monitor cannot display].

RELOCATION AND STORAGE OF SERVER SWITCH UNIT

⚠ WARNING

Observe the following instructions to use the server and peripheral devices safely. Failure to follow these instructions may result in death or serious personal injury. See pages iii to xvi for details.

- Do not disassemble, repair, or alter the server switch unit.
- Disconnect the power cord and dedicated cables before working with the server switch unit.

⚠ CAUTION

Observe the following instructions to use the server and peripheral devices safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages iii to xvi for details.

- Be sure to completely install the server switch unit.

IMPORTANT：

- If the server switch unit needs to be relocated or stored due to a change in the floor layout to a great extent, contact your service representative.
- It is recommended that the server switch unit should be stored in a place where the room temperature can be maintained. It is important for the server switch unit to work normally after storage. Store the unit in the place where temperature ranges between -10 to 55°C and humidity ranges between 20 to 80%, without dew condensation.

8. Remove the power cord and dedicated cables from the server switch unit referring to Chapter 1. In cases where the server switch unit is installed in a rack, remove the unit from the rack.

9. Package the server switch unit with packaging material and shipping carton which originally came with the unit. If you do not have them, use shock-absorbing material to shield the server switch unit from excessive shock and/or vibrations so that the unit will not be damaged.

USER SUPPORT

Before asking for repair, do the following when the server switch unit appears to fail:

1. Check if the power cord and the cables to other devices are properly connected.
2. See the section "TROUBLESHOOTING" to find if your problem fits the description. If it does, take the recommended measure for it.
3. Check if the server switch unit and the servers are correctly configured.

If the server switch unit still appears to fail after you have taken the above actions, consult with your service representative immediately. Take notes on lamp and OSD indications and alarm indications on the display unit before consultation, which may provide a significant help to your service representative.

APENNDIX A SPECIFICATIONS

Item		Specification
		N8191-10F
Number of connected servers	Standalone	8 max.
	In cascade connection	64 max. (when nine server switch units are used)
Selection mode		Server selection switch and keyboard in hot key mode.
Lamp indication		Server online (8) and server selection (8)
Console port	KB	PS/2, mini DIN 6P, female (1)
	MOUSE	PS/2, mini DIN 6P, female (1)
	Monitor	Mini D-SUB 15P, female (1)
Server port	Monitor	Mini D-SUB 15P, female (8)
Auto scan mode		Auto scan switch and keyboard in hot key mode.
Auto scan period		3/5/10/20/40/60 seconds (initial value: 10)
Display unit	Resolution	1600 x 1200
	Refresh rate	75 Hz
Power supply		100V - 240 V AC, 60/50Hz
Current consumption		0.06(100V) / 0.03A(200V)
Available current supplied from KB and Mouse ports		150 mA max.
Operating temperature/humidity		10 to 35°C, 20 to 80%RH
External dimension and weight		437(W) × 210(D) × 42(H) mm, 2.8 kg